



BioMap and Living Waters

Guiding Land Conservation for Biodiversity in Massachusetts

Core Habitats of Otis

This report and associated map provide information about important sites for biodiversity conservation in your area.

This information is intended for conservation planning, and is not intended for use in state regulations.

Produced by:
Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries and Wildlife
Executive Office of Environmental Affairs
Commonwealth of Massachusetts

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Guiding Land Conservation for Biodiversity in Massachusetts

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* Depending on the location of Core Habitats, your city or town may not have all of these sections.

Spring Salamander
(*Gyrinophilus porphyriticus*)
Species of Special Concern



Funding for this project was made available by the Executive Office of Environmental Affairs, contributions to the Natural Heritage & Endangered Species Fund, and through the State Wildlife Grants Program of the US Fish & Wildlife Service.



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Introduction

In this report, the Natural Heritage & Endangered Species Program provides you with site-specific biodiversity information for your area. Protecting our biodiversity today will help ensure the full variety of species and natural communities that comprise our native flora and fauna will persist for generations to come.

The information in this report is the result of two statewide biodiversity conservation planning projects, **BioMap** and **Living Waters**. The goal of the BioMap project, completed in 2001, was to identify and delineate the most important areas for the long-term viability of terrestrial, wetland, and estuarine elements of biodiversity in Massachusetts. The goal of the Living Waters project, completed in 2003, was to identify and delineate the rivers, streams, lakes, and ponds that are important for freshwater biodiversity in the Commonwealth. These two conservation plans are based on documented observations of rare species, natural communities, and exemplary habitats.

What is a Core Habitat?

Both BioMap and Living Waters delineate **Core Habitats** that identify the most critical sites for biodiversity conservation across the state. Core Habitats represent habitat for the state's most viable rare plant and animal populations and include exemplary natural communities and aquatic habitats. Core Habitats represent a wide diversity of rare species and natural communities (see Table 1), and these areas are also thought to contain virtually all of the other described species in Massachusetts. Statewide, BioMap Core Habitats encompass 1,380,000 acres of uplands and wetlands, and Living Waters identifies 429 Core Habitats in rivers, streams, lakes, and ponds.



Core Habitats and Land Conservation

One of the most effective ways to protect biodiversity for future generations is to protect Core Habitats from adverse human impacts through land conservation. For Living Waters Core Habitats, protection efforts should focus on the **riparian areas**, the areas of land adjacent to water bodies. A naturally vegetated buffer that extends 330 feet (100 meters) from the water's edge helps to maintain cooler water temperature and to maintain the nutrients, energy, and natural flow of water needed by freshwater species.

In Support of Core Habitats

To further ensure the protection of Core Habitats and Massachusetts' biodiversity in the long-term, the BioMap and Living Waters projects identify two additional areas that help support Core Habitats.

In BioMap, areas shown as **Supporting Natural Landscape** provide buffers around the Core Habitats, connectivity between Core Habitats, sufficient space for ecosystems to function, and contiguous undeveloped habitat for common species. Supporting Natural Landscape was



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generated using a Geographic Information Systems (GIS) model, and its exact boundaries are less important than the general areas that it identifies. Supporting Natural Landscape represents potential land protection priorities once Core Habitat protection has been addressed.

In Living Waters, *Critical Supporting Watersheds* highlight the immediate portion of the watershed that sustains, or possibly degrades, each freshwater Core Habitat. These areas were also identified using a GIS model. Critical Supporting Watersheds represent developed and undeveloped lands, and can be quite large. Critical Supporting Watersheds can be helpful in land-use planning, and while they are not shown on these maps, they can be viewed in the Living Waters report or downloaded from www.mass.gov/mgis.

Understanding Core Habitat Species, Community, and Habitat Lists

What's in the List?

Included in this report is a list of the species, natural communities, and/or aquatic habitats for each Core Habitat in your city or town. The lists are organized by Core Habitat number.

For the larger Core Habitats that span more than one town, the species and community lists refer to the entire Core Habitat, not just the portion that falls within your city or town. For a list of all the state-listed rare species within your city or town's boundary, whether or not they are in Core Habitat, please see the town rare species lists available at www.nhesp.org.

The list of species and communities within a Core Habitat contains only the species and

Table 1. The number of rare species and types of natural communities explicitly included in the BioMap and Living Waters conservation plans, relative to the total number of native species statewide.

BioMap		
Biodiversity Group	Species and Verified Natural Community Types	
	Included in BioMap	Total Statewide
Vascular Plants	246	1,538
Birds	21	221 breeding species
Reptiles	11	25
Amphibians	6	21
Mammals	4	85
Moths and Butterflies	52	An estimated 2,500 to 3,000
Damselflies and Dragonflies	25	An estimated 165
Beetles	10	An estimated 2,500 to 4,000
Natural Communities	92	> 105 community types
Living Waters		
Biodiversity Group	Species	
	Included in Living Waters	Total Statewide
Aquatic Vascular Plants	23	114
Fishes	11	57
Mussels	7	12
Aquatic Invertebrates	23	An estimated > 2500

natural communities that were explicitly included in a given BioMap or Living Waters Core Habitat. Other rare species or examples of other natural communities may fall within the Core Habitat, but for various reasons are not included in the list. For instance, there are a few rare species that are omitted from the list or summary because of their particular sensitivity to the threat of collection. Likewise, the content of many very small Core Habitats are not described in this report or list, often because they contain a single location of a rare plant



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species. Some Core Habitats were created for suites of common species, such as forest birds, which are particularly threatened by habitat fragmentation. In these cases, the individual common species are not listed.

What does 'Status' mean?

The Division of Fisheries and Wildlife determines a status category for each rare species listed under the Massachusetts Endangered Species Act, M.G.L. c.131A, and its implementing regulations, 321 CMR 10.00. Rare species are categorized as Endangered, Threatened, or of Special Concern according to the following:

- **Endangered** species are in danger of extinction throughout all or a significant portion of their range or are in danger of extirpation from Massachusetts.
- **Threatened** species are likely to become Endangered in Massachusetts in the foreseeable future throughout all or a significant portion of their range.
- **Special Concern** species have suffered a decline that could threaten the species if allowed to continue unchecked or occur in such small numbers or with such restricted distribution or specialized habitat requirements that they could easily become Threatened in Massachusetts.

In addition, the Natural Heritage & Endangered Species Program maintains an unofficial **watch list** of plants that are tracked due to potential conservation interest or concern, but are not regulated under the Massachusetts Endangered Species Act or other laws or regulations. Likewise, described natural communities are not regulated any laws or regulations, but they can help to identify ecologically important areas that are worthy of protection. The status of natural

Legal Protection of Biodiversity

BioMap and Living Waters present a powerful vision of what Massachusetts would look like with full protection of the land that supports most of our biodiversity. To create this vision, some populations of state-listed rare species were deemed more likely to survive over the long-term than others.

Regardless of their potential viability, all sites of state-listed species have full legal protection under the Massachusetts Endangered Species Act (M.G.L. c.131A) and its implementing regulations (321 CMR 10.00). Habitat of state-listed wildlife is also protected under the Wetlands Protection Act Regulations (310 CMR 10.37 and 10.59). The **Massachusetts Natural Heritage Atlas** shows **Priority Habitats**, which are used for regulation under the Massachusetts Endangered Species Act and Massachusetts Environmental Policy Act (M.G.L. c.30) and **Estimated Habitats**, which are used for regulation of rare wildlife habitat under the Wetlands Protection Act. For more information on rare species regulations, see the *Massachusetts Natural Heritage Atlas*, available from the Natural Heritage & Endangered Species Program in book and CD formats.

BioMap and Living Waters are conservation planning tools and do not, in any way, supplant the Estimated and Priority Habitat Maps which have regulatory significance. Unless and until the combined BioMap and Living Waters vision is fully realized, we must continue to protect all populations of our state-listed species and their habitats through environmental regulation.

communities reflects the documented number and acreages of each community type in the state:

- **Critically Imperiled** communities typically have 5 or fewer documented sites or have very few remaining acres in the state.
- **Imperiled** communities typically have 6-20 sites or few remaining acres in the state.
- **Vulnerable** communities typically have 21-100 sites or limited acreage across the state.
- **Secure** communities typically have over 100 sites or abundant acreage across the state; however excellent examples are identified as Core Habitat to ensure continued protection.



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Understanding Core Habitat Summaries

Following the BioMap and Living Waters Core Habitat species and community lists, there is a descriptive summary of each Core Habitat that occurs in your city or town. This summary highlights some of the outstanding characteristics of each Core Habitat, and will help you learn more about your city or town's biodiversity. You can find out more information about many of these species and natural communities by looking at specific *fact sheets* at www.nhesp.org.

Next Steps

BioMap and Living Waters were created in part to help cities and towns prioritize their land protection efforts. While there are many reasons to conserve land – drinking water protection, recreation, agriculture, aesthetics, and others – BioMap and Living Waters Core Habitats are especially helpful to municipalities seeking to protect the rare species, natural communities, and overall biodiversity within their boundaries. Please use this report and map along with the rare species and community fact sheets to appreciate and understand the biological treasures in your city or town.

Protecting Larger Core Habitats

Core Habitats vary considerably in size. For example, the average BioMap Core Habitat is 800 acres, but Core Habitats can range from less than 10 acres to greater than 100,000 acres. These larger areas reflect the amount of land needed by some animal species for breeding, feeding, nesting, overwintering, and long-term survival. Protecting areas of this size can be

very challenging, and requires developing partnerships with neighboring towns.

Prioritizing the protection of certain areas within larger Core Habitats can be accomplished through further consultation with Natural Heritage Program biologists, and through additional field research to identify the most important areas of the Core Habitat.

Additional Information

If you have any questions about this report, or if you need help protecting land for biodiversity in your community, the Natural Heritage & Endangered Species Program staff looks forward to working with you.

Contact the Natural Heritage & Endangered Species Program:

by Phone 508-792-7270, Ext. 200

by Fax: 508-792-7821

by Email: natural.heritage@state.ma.us.

by Mail: North Drive
Westborough, MA 01581

The GIS datalayers of BioMap and Living Waters Core Habitats are available for download from MassGIS: www.mass.gov/mgis

Check out www.nhesp.org for information on:

- Rare species in your town
- Rare species fact sheets
- BioMap and Living Waters projects
- Natural Heritage publications, including:
 - * Field guides
 - * Natural Heritage Atlas, and more!



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BioMap: Species and Natural Communities

Otis

Core Habitat BM857

Natural Communities

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Acidic Shrub Fen		Vulnerable

Plants

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Dwarf Mistletoe	<i>Arceuthobium pusillum</i>	Special Concern

Core Habitat BM865

Vertebrates

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
American Bittern	<i>Botaurus lentiginosus</i>	Endangered
Spring Salamander	<i>Gyrinophilus porphyriticus</i>	Special Concern
Wood Turtle	<i>Clemmys insculpta</i>	Special Concern

Core Habitat BM868

Natural Communities

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Level Bog		Vulnerable

Plants

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Thread Rush	<i>Juncus filiformis</i>	Endangered

Core Habitat BM892

Invertebrates

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Harpoon Clubtail	<i>Gomphus desertus</i>	Endangered



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BioMap: Species and Natural Communities

Otis

Core Habitat BM895

Natural Communities

Common Name

Scientific Name

Status

Level Bog

Vulnerable

Core Habitat BM938

Plants

Common Name

Scientific Name

Status

Small Site for Rare Plant

Core Habitat BM994

Invertebrates

Common Name

Scientific Name

Status

Beaver Pond Clubtail

Gomphus borealis

Special Concern

Harpoon Clubtail

Gomphus descriptus

Endangered

Core Habitat BM975, BM977, BM978, BM981, BM989, BM994, BM1005, BM1012, BM1013, and BM1016

Communities

High-Energy Riverbank

Vulnerable



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BioMap: Core Habitat Summaries

Otis

Core Habitat BM857

Natural Communities

This is a large and high-quality example of an Acidic Shrub Fen that contains many typical northern bog species and is well-buffered by upland forest. Acidic Shrub Fens are shrub-dominated acidic peatlands found primarily along pond margins in the eastern and central part of the state. These wetland communities experience some groundwater and/or surface water inputs, but no calcareous seepage.

Plants

Within this Acidic Shrub Fen, Black Spruce is host to the hemi-parasitic Dwarf Mistletoe.

Core Habitat BM865

Vertebrates

This is a large, multi-lobed Core Habitat that encompasses riparian habitats and adjacent uplands along several miles of brooks and small streams. These extensive riparian habitats provide significant habitat for Wood Turtles, especially in areas of meandering streams with sandy or gravel bottoms, scattered wet meadows and shrub swamps, and adjacent upland forests and small fields. Miles of high-gradient brooks and headwater seeps also provide significant habitat for Spring Salamanders. Wet meadows and shallow marshes created or modified by beavers provide habitat for American Bitterns and other wetland birds, especially along sections of Ripley Brook in Granville. Although large areas are protected as conservation land, the majority of this Core Habitat is unprotected at present.

Core Habitat BM868

Natural Communities

This Core Habitat contains the best currently known Level Bog in Berkshire County and is one of the top three Level Bogs on the BioMap. Level Bogs are dwarf shrub peatlands, generally with pronounced hummock and hollow formations. These wetland peatlands are our most acidic and nutrient-poor, because they receive little overland water input, and are not connected to the water table. Here the bog's 23 acres are well-buffered by natural vegetation.



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BioMap: Core Habitat Summaries

Otis

Core Habitat BM892

Invertebrates

This Core Habitat includes a 2.5-km stretch of the West Branch of the Farmington River and associated wetlands that are habitat for the rare Harpoon Clubtail dragonfly. The surrounding landscape is both forested and relatively unfragmented, which protects the river from pollution. This Core Habitat is located less than 6 km from other habitat for the Harpoon Clubtail within Core Habitat downstream, which allows for dispersal of individual dragonflies between these two areas. While the northwestern quarter of this Core Habitat is within the Farmington River Wildlife Management Area, the remaining three-quarters of the habitat appear to be unprotected.

Core Habitat BM895

Natural Communities

This Core Habitat contains a Level Bog of moderate quality, within a beautiful, isolated pond with high scenic value. Level Bogs are dwarf shrub peatlands, generally with pronounced hummock and hollow formations. These wetland peatlands are our most acidic and nutrient-poor, because they receive little overland water input, and are not connected to the water table.

Core Habitat BM994

Invertebrates

This Core Habitat includes a 1.5-km stretch of the Farmington River and associated wetlands that are habitat for both the rare Beaver Pond Clubtail dragonfly and the Endangered Harpoon Clubtail dragonfly. This Core Habitat is located less than 10 km from other Core Habitats for these rare dragonflies. This proximity probably allows for dispersal of individual dragonflies among all of these areas. This Core Habitat appears to be unprotected.

Core Habitat BM975, BM977, BM978, BM981, BM989, BM994, BM1005, BM1012, BM1013, and BM1016

Natural Communities

This Core Habitat complex includes several patches of species-rich, good-quality High-Energy Riverbank. High-Energy Riverbank communities are sparse, open graminoid communities found on cobble deposits along fast-flowing rivers that experience severe flooding and ice scour. The combined length of the community patches here is over 2 km. Although paved roads are near, this community occurs on the edge of several large natural areas ranging up to 4000 acres in size.



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Living Waters: Species and Habitats

Otis

Core Habitat LW008

Exemplary Habitats

Common Name

Scientific Name

Status

Invertebrate Habitat

Core Habitat LW086

Fishes

Common Name

Scientific Name

Status

Bridle Shiner

Notropis bifrenatus

Special Concern

Core Habitat LW095

Fishes

Common Name

Scientific Name

Status

Bridle Shiner

Notropis bifrenatus

Special Concern

Core Habitat LW096

Fishes

Common Name

Scientific Name

Status

Bridle Shiner

Notropis bifrenatus

Special Concern

Core Habitat LW100

Fishes

Common Name

Scientific Name

Status

Bridle Shiner

Notropis bifrenatus

Special Concern

Core Habitat LW232

Invertebrates

Common Name

Scientific Name

Status

Brook Floater

Alasmidonta varicosa

Endangered

Eastern Pearlshell

Margaritifera margaritifera



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Living Waters: Species and Habitats

Otis

Triangle Floater

Alasmidonta undulata

Special Concern

Core Habitat LW316

Invertebrates

Common Name

Scientific Name

Status

Brook Floater

Alasmidonta varicosa

Endangered

Triangle Floater

Alasmidonta undulata

Special Concern

Fishes

Common Name

Scientific Name

Status

Bridle Shiner

Notropis bifrenatus

Special Concern



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Living Waters: Core Habitat Summaries

Otis

Core Habitat LW008

This section of Hop Brook flows out of a wetland fed by Hayes Pond in Tyringham, through the town of Otis, and back to Tyringham and into Sodem Pond. The area is forested with steep banks and many boulders, and water flow is fast over and around the brook's boulders and cobbles. The brook supports a healthy community of the more ecologically sensitive aquatic insects: mayflies, stoneflies, and caddisflies. The presence of this invertebrate community indicates the stream habitats here are relatively free of the impacts of development. Forested stream banks help maintain the high-quality habitat by shading the water to keep it cool, by providing a natural energy source to the stream ecosystem in the form of leaves and sticks, and by controlling the runoff of sediments, excess nutrients, and water.

Core Habitat LW086

This Core Habitat supports one of six known populations of Bridle Shiner in the Farmington Watershed. This fish Species of Special Concern has a small range from southern New England to South Carolina, and has been declining or extirpated in much of the region. The Bridle Shiner is typically found in well-vegetated, quiet waters. It feeds on small aquatic insects and other invertebrates, and is an important part of the freshwater ecosystem as prey for larger fishes.

Core Habitat LW095

This Core Habitat supports one of six known populations of Bridle Shiner in the Farmington Watershed. This fish Species of Special Concern has a small range from southern New England to South Carolina, and has been declining or extirpated in much of the region. The Bridle Shiner is typically found in well-vegetated, quiet waters. It feeds on small aquatic insects and other invertebrates, and is an important part of the freshwater ecosystem as prey for larger fishes. This population of Bridle Shiner in the Otis Reservoir has persisted since at least 1947.

Core Habitat LW096

This Core Habitat supports one of six known populations of Bridle Shiner in the Farmington Watershed. This fish Species of Special Concern has a small range from southern New England to South Carolina, and has been declining or extirpated in much of the region. The Bridle Shiner is typically found in well-vegetated, quiet waters. It feeds on small aquatic insects and other invertebrates, and is an important part of the freshwater ecosystem as prey for larger fishes. This population of Bridle Shiner in Shaw Pond has persisted since at least 1947.

Core Habitat LW100

This Core Habitat supports one of six known populations of Bridle Shiner in the Farmington Watershed. This fish Species of Special Concern has a small range from southern New England to South Carolina, and has been declining or extirpated in much of the region. The Bridle Shiner is typically found in well-vegetated, quiet waters. It feeds on small aquatic insects and other invertebrates, and is an important part of the freshwater ecosystem as prey for larger fishes. This population of Bridle Shiner in Benton Pond has persisted since at least 1947.



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Living Waters: Core Habitat Summaries

Otis

Core Habitat LW232

The West Branch of the Farmington River supports five of the state's twelve freshwater mussel species, including a population of the Endangered Brook Floater. This species is thought to be sensitive to low oxygen and excess sediments, and is only found in four other water bodies in the state. The rare Triangle Floater and the uncommon Eastern Pearlshell are also found here. All three of these mussels occur in moderately flowing stretches of the river, often below riffles in areas out of the way of the current, such as those behind sand bars or large boulders.

Core Habitat LW316

The West Branch of the Farmington River supports five of the state's twelve freshwater mussel species, including a population of the Endangered Brook Floater. This species is thought to be sensitive to low oxygen and excess sediments, and is only found in four other water bodies in the state. The rare Triangle Floater and the uncommon Eastern Pearlshell are also found here. All three of these mussels occur in moderately flowing stretches of the river, often below riffles in areas out of the way of the current, such as those behind sand bars or large boulders.

This Core Habitat also supports one of six known populations of Bridle Shiner in the Farmington Watershed. This fish Species of Special Concern has a small range from southern New England to South Carolina, and has been declining or extirpated in much of the region. The Bridle Shiner feeds on small aquatic insects and other invertebrates, and is an important part of the freshwater ecosystem as prey for larger fishes.



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